

L 26005-66

ACC NR: AT6013435

(N, A)

SOURCE CODE: UR/0000/65/000/000/0024/0031

AUTHOR: Razleytsev, N. F.

ORG: Kharkov Polytechnic Institute (Khar'kovskiy politekhnicheskiy institut)

TITLE: The effect of the temperature of supercharger air on the operating conditions and basic characteristics of a diesel locomotive engine

SOURCE: Dvigateli vnutrennego sgoraniya (Internal combustion engines), No. 1, Kharkov, Izd-vo Khar'k. univ., 1965, 24-31

TOPIC TAGS: engine cooling system, temperature, diesel engine, heat exchanger, supercharged engine, turbosupercharged engine, supercharger, specific fuel consumption / 16 ChN 24/27 diesel engine

ABSTRACT: Studies in improving the 16 ChN 24/27 diesel locomotive engine with high gas-turbine supercharging from a self-contained compressor are discussed. The experimental part of the work was done with a one-cylinder section of the engine. It was found that cooling of the supercharger air makes it possible to increase the maximum possible power of the engine and to improve its economy under all operating conditions  $\geq 25\%$  of the rated load and  $> 600$  rpm (see Fig. 1). To ensure smooth operation of the engine at reduced speeds and also to reduce fuel consumption and to improve the no-load operating conditions, the cooler should be disconnected and the air heated to 50--80C. A simple surface heat exchanger with an efficiency of about 0.6 is

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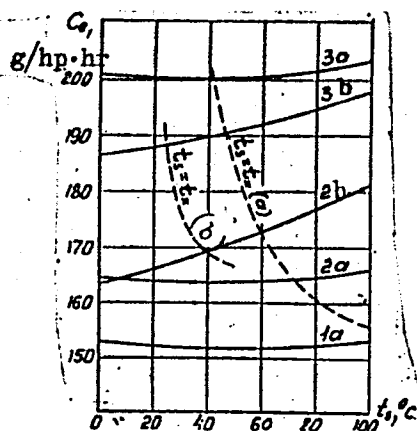


Fig. 1. Specific effective fuel consumption versus temperature of supercharger air. a -  $n_e = 1000$  rpm; b -  $n_e = 700$  rpm; 1 - 100% rated load; 2 - 50% rated load; 3 - 25% rated load.

sufficient for cooling the supercharger air of the 16 ChN 24/27 engine with a self-contained compressor. Orig. art. has: 1 formula and 4 graphs.

SUB CODE: 21/ SUBM DATE: 20Apr65/ ORIG REF: 007

Card 2/2

RAZLIVALOV, G. K.

RAZLIVALOV, G. K. -- "The Types of Cedar Forests in East Kazakhstan Oblast." Min Agriculture USSR, Kazakh State Agricultural Inst, Alma-Ata, 1956. (Dissertation for the Degree of Candidate of Technical Sciences)

SC: Knizhnaya Letopis' No 44, October 1956

RAZLIVANOV, V.

Effect of changes in the fatness of cattle on the cost of meat.  
Mias. ind. SSSR 30 no.5:40-41 '59. (MIRA 13:1)

1. Khersonskiy sovnarkhoz.  
(Meat industry)

1. WJ, PIA: 001444420016-5

Summary of joint equipment and data in the area of  
1. 001444420016-5

ACC NR: AP7006029

SOURCE CODE: UR/0066/66/000/007/0043/0044

AUTHOR: Kozhukhov, V. V.; Razlozhko, S. D.

ORG: Primorsko-Akhtarskiy Fish Plant (Primorsko-Akhtarskiy rybozavod)

TITLE: Experience in using GKA-2 apparatus at the Primorsk-Akhtar Fish Plant

SOURCE: Kholodil'naya tekhnika, no. 7, 1966, 43-44

TOPIC TAGS: refrigeration equipment, food preservation

ABSTRACT: The GKA-2 conveyor freezing device has been in operation since the Fall of 1964. The apparatus was supplied by the "Prodmarsh" plant with considerable defects in manufacture and equipment supplied, which hindered its installation and initiation of operation. Various points, such as the lubrication of the device, have been improved by the workers at the fish freezing plant. The receiving portion of the machine was strengthened with an extra support rod, and additional servicing holes were cut to provide access to difficultly accessible mechanisms. The device has considerably increased the productivity of the plant, and provides fish frozen in rectangular blocks, which facilitates further storage and processing. The fish plant has installed two additional such devices. Orig. art. has: 1 figure and 1 table. [JPRS: 38,961]

SUB CODE: 06, 13 / SUBM DATE: none

Card 1/1

UDC: 681.2:664.951.037.5

09270814

J

Country : USSR  
Category: Soil Science Organic Fertilizers

Abs Jour: RZhBiol., No 14, 1958, No 63118

Author : Zelengur, N. Ye.; Razlukina, M.L.  
Inst : Far East Scientific-Research Institute of Agriculture  
Title : The Utilization of Local Fertilizers on Meadow-Soddy  
Soils of Sakhalin.

Orig Pub: Byul. nauchno-tekhn. inform Dal'ne-vost n -i. in-ta  
s. Kh., 1957, 3, 17-19

Abstract: According to the results of experiments by the Sakhalins-  
kaya Experimental Station on meadow-soddy heavy soil,  
typical for the island, with increased acidity, the  
cabbage-crop-increase average for 3 years (1952-1954)  
was: from 20 tons of peat-manure mixture, 116.1 centners/  
hectare; from 20 tons of peat-manure mixture, 92.5 as

Card : 1/2

J-53

GOL'TSOV, A.A.; DUDOROV, I.T.; KOLOMIYETS, A.A.; RAZLUKINA,  
M.L.; KURZINA, I.A., red.; CHICHEV, Yu.I., red.

[Vegetable farming in a mechanized vegetable-gardening  
brigade; experience with A.L.Karputtseva's brigade  
("Bolshevik" State Farm in Moscow Province)] Vozdelyvanie  
ovoshchei v mekhanizirovannoi ovoshchevodcheskoi brigade;  
opyt brigady A.L.Karputtsevoi (sovkhoz "Bol'shevik" Mo-  
skovskoi oblasti) Moskva, Kolos, 1965. 134 p.  
(MIRA 18:7)



KONDRASHOVA, L.F., RAZLUKINA, M.L

[Cabbage on Sakhalin] Kapusta na Sakhaline. Iuzhno-  
Sakhalinsk, Izd. gazety "Sovetskii Sakhalin," 1955. 43 p.  
(MIRA 15:8)

(Sakhalin Cabbage)

RAZLUKINA, M. L., Cand. Agri. Sci. (diss) "Basic Agro-technical Measures for Raising Yields of Tomatoes and Cabbages on Sakhalin, and their Economic Effectiveness," Saratov, 1961, 19 pp (Saratov Agri. Inst.) 150 copies (KL Supp 12-61, 280).

SOV/112-57-6-13144

Translation from: Referativnyy zhurnal. Elektrotehnika, 1957, Nr 6,  
pp 212-213 (USSR)

AUTHOR: Razmadze

TITLE: Analysis of Electromagnetic Phenomena in an 18-Phase Series Valve  
Circuit (Analiz elektromagnitnykh protsessov v vosemnadtsatifaznoy  
posledovatel'noy ventil'noy skheme)

PERIODICAL: Tr. Gruz. politekhn. in-ta, 1956, Nr 2 (43), pp 107-122

ABSTRACT: The circuit comprises a 6-winding transformer and 18 single-anode valves. Secondary phase-to-neutral voltage vectors are 40° apart. The valves are connected in 3 three-phase bridge circuits, the bridges being connected in series. Such a circuit has the following advantages: good utilization of the transformer, a high ratio of the rectified-to-secondary phase-to-neutral voltage (equal to 7.02), a relatively low back voltage, small rectified voltage ripple, absence in the primary current of harmonics below the 17th. The circuit was analyzed with an allowance for the inductance of anode chokes

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SOV/112-57-6-13144

Analysis of Electromagnetic Phenomena in an 18-Phase Series Valve Circuit

connected to limit short-circuit currents, with an assumption of infinite inductance in the cathode circuit, without an allowance for voltage drop on the valve arc, and without an allowance for the resistances and capacitive reactances of all circuit components. Analytical expressions are presented for the external characteristic at various operating conditions of the rectifier, which differ in the magnitude of load, in switching time, in the number of simultaneously-conducting valves, in grid-control angle. It is pointed out that the 18-phase circuit can be recommended for long-distance DC transmission.

I. L. R.

Card 2/2

TROFIMENKO, A.P.; FEDORUS, G.A.; RAZMADZE, A.K.

Some peculiarities of heat-stimulated conductivity in CsS-single crystals. Fiz.tver.tela 2 no.6:1141-1147 Je '60. (MIRA 13:8)

1. Institut fiziki AN USSR, Kiyev.  
(Cadmium sulfide crystals--Electric properties)

81630

S/181/60/002/06/18/050  
B122/B063

24.7600  
AUTHORS:

Trofimenko, A. P., Fedorus, G. A., Razmadze, A. K.

TITLE:

Some Peculiarities of the Thermal Stimulation of the Conductivity of CdS Single Crystals

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 6, pp. 1141 - 1147

TEXT: The article under review deals with the following problems of the above-mentioned subject: recombination and filling up of electron traps at the maximum of thermally stimulated conductivity (TSC), the part played by the surface in this connection, and the possible relationship between the photoconductivity of CdS single crystals and the area of the TSC curve. TSC was measured by means of an apparatus described in the paper of Ref. 7. The specimens were exposed to white light, the wavelengths  $\lambda > 0.8 \mu$  being excluded. Beside samples with a pure stoichiometrical ratio of the components, the authors studied such with an excess of one component. The measurements obtained were in full agreement with those already described in Ref. 7. At a Cd excess, peaks were observed in the range of  $-195$  to  $-180^\circ\text{C}$ , and at

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Some Peculiarities of the Thermal Stimulation of the Conductivity of CdS Single Crystals

S/181/60/002/06/18/050  
B122/B063

only a slight Cd excess, also a peak in the range of  $15 - 25^{\circ}\text{C}$ , at an S excess a number of peaks, the highest peak at  $0 - 6^{\circ}\text{C}$ . From the results obtained here and from further investigations on the temperature dependence of the adhesion cross section of the excess component  $\sigma(T)$  the attempt was made to determine the depth of the levels caused by the excess. Experiments were made at higher temperatures on CdS(Au) and CdS(S) crystals which were kept at low temperatures and were then hardened. In these crystals, the plane bounded by the TSC curve is completely independent of temperature. Such a dependence was, however, established on the CdS(S) single crystal (Fig. 1). A maximum filling of the traps with electrons at the various illumination conditions takes place at  $-65$  to  $-50^{\circ}\text{C}$ .  $\sigma(T)$  drops exponentially with all crystals, which fact is ascribed to the necessity of surmounting a potential threshold in these crystals. At high temperatures as well it is possible to observe a decrease in the filling of the local levels, but no explanation could be provided for this. Experiments made on the determination of the filling degree at temperatures of the TSC maximum ( $\bar{T}$ ) (Fig. 3) showed the recombination taking place to be predominantly monomolecular. Experiments made on the dependence of the TSC on the wavelength of light

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Some Peculiarities of the Thermal Stimulation of the Conductivity of CdS Single Crystals

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revealed a decrease in the maxima with strong light absorption. This was best observed on CdS(S). A special treatment of the surface (short etching with HCl) did not appreciably change the TSC peaks nor photosensitivity, and new maxima did not arise. This shows that the impurities on the crystals did not form any surface film, but that they penetrate into the crystals. The influence of mica discharge manifested itself by a considerable enlargement of the areas of the TSC curves, a strong increase in light sensitivity and by the appearance of a strongly retarded quasi-dark conductance (Fig. 4, the peak becomes very much larger). The determination of the level depth is rendered more difficult in this connection. The study of a dependence between TSC curve areas and photosensitivity revealed (data in a table) that samples undergoing the same treatment exhibit the same relation between the quantities mentioned. A rigorous correlation between the two quantities can be set up only under consideration of the lifetime of electrons in the conduction band. Still, it was possible to establish a certain dependence of the photosensitivity on the concentration of the local levels in the outer part of the forbidden zone. The authors finally thank Professor V. Ye. Lashkarev, Academician of the AS UkrSSR for having supervised the work. There are 4 figures, 1 table, and 14 references.

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Some Peculiarities of the Thermal Stimulation of the Conductivity of CdS Single Crystals

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S/181/60/002/0618/050  
B122/B063

7 Soviet and 2 German.

ASSOCIATION: Institut fiziki AN USSR, Kiyev (Institute of Physics of the  
AS UkrSSR, Kiyev)

SUBMITTED: July 21, 1959

Card 4/4

X

RAZMADZE, Aleksandr Nikolayevich

[Aluminum alloys in structures and building] [Alumi-  
nievye splavy v konstruktsiyakh i stroitel'stve. Tbi-  
lisi, Sabchota Sakartvelo] 1964. 152 p. [In Georgian]  
(MIRA 18:7)

RAZMADZE, A.N.; KOKOSHASHVILI, R.I.; MFIASHVILI, Yu.K.; CHITAYSHVILI, Z. A.

New type of standardized single-circuit 110 kv. overhead power  
transmission line tower for mountainous areas. Trudy GPI [Gruz.]  
no.1:153-159 '63. (MIRA 18:2)

RAZVAYE, A.V., Doc Techn Sci -- (diss) "Analysis of the dynamic  
and aerodynamic stability of suspension bridges of various  
systems." Len, 1958, 28 pp (Min of Higher Education USSR.  
Len Order of Labor Red Banner Engineering Construction Inst)  
180 copies (RL, 27-58, 107)

- 7L -

INITIALS, A.E.

Recent computer elements for roofs of large-span structures  
and the bases for calculating them. Trudy TPI (Gruz.) no.1:91-  
100 63. (MIRA 18:2)

RAZVADZE, A. N.

RAZVADZE, A. N. "The approximate calculation of the frequency of free oscillations of suspension steel bridges," A commemorative collection of transactions dedicated to the 25th anniversary of the Institute, (Gruz. politekh. in-t im. Kirova, No. 17), Tbilisi, 1948, p. 175-178, (In Georgian, resume in Russian), - Bibliog: 5 items

SO: U-5240, 17Dec53, (Letopis 'Zhurnal 'nykh Statey, No. 25, 1949).

4/123/00/000/006/003/020  
A. 04/A104

AUTHORS: Tsotsknadze, V. V., and Bektadze, A. A.

TITLE: The wear of ceramic and ceramic sintered carbides during the cutting of hot rolled material.

PERIODICAL: Referativnyi zhurnal, Mashinostroyeniye, no. 6, 1961, 31, abstract 6b221 [Fr. Abstr. polit. tekhn. 10-57, Skhronet, 1959, no. 3 [64], 155-165, Georgian summary]

TEXT: The authors comment on the low life of steel disc saws during the cutting of hot rolled material. To search expedient cutting materials, the sintered carbide grades T15K6, T60K6, T94V13Ag, HT2 (W12), the mineral-ceramic UM332 (TsM332) alloy and the German mineral-ceramic C40 (S40) alloy were investigated. The authors present comparative durability tests of the materials under investigation during continuous (turning) and non-continuous (milling) cutting. The life indices of the cutting materials were rated by the results of the cutting tool wear. Based on the test data it was found that the T15K6 sintered carbide is a suitable material for the cutting of hot rolled material, although the W12 grade sintered carbide has some prospects for the cutting of hot

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The wear of ceramets and ceramite. ...

S/123/61/000/006/003/020  
A004/A104

rolled material in the rolling process is accompanied by a fixed coating system.  
There are 5 figures, 2 tables and 6 references.

W. Bernstein

[Abstractor's note: Complete translation]

Card 2/2



RAZMADZE, G. I.

Razmadze, G. I. -- "Contraction of Cuttings and Temperature of Cutting in the Case of Face Milling of Steel." Min Higher Education USSR, Georgian Order of Labor Red Banner Polytechnic Inst imeni S.M. Kirov, Tbilisi, 1955 (Dissertation for the Degree of Candidate in Technical Sciences)

SO: Knizhnaya Letopis', No. 23, Moscow, Jun 55, pp 87-104

RAZMADZE, G.I., kand.tekhn.nauk

Determining the heat of cutting during intermittent cutting.  
Izv.vys.ucheb.zav.; mashinostr. no.2:128-135 '59.  
(MIRA 13:3)

1. Gruzinskiy politekhnicheskii institut.  
(Metal cutting)

Razmadze, G. N. On torsion of circular shafts of variable cross-section due to impact. Soobšçeniya Akad. Nauk Gruzin. SSR 14, 91-94 (1953). (Russian)

The note contains a brief consideration of those solutions of the system of vibration equations

$$\mu \nabla^2 u_\alpha + (\lambda + \mu) \frac{\partial \vartheta}{\partial x_\alpha} = \rho \ddot{u}_\alpha, \quad \alpha = 1, 2,$$

$$\frac{\partial \vartheta}{\partial x_3} = 0, \quad \vartheta = \frac{\partial u_1}{\partial x_1} + \frac{\partial u_2}{\partial x_2} + \frac{\partial u_3}{\partial x_3},$$

that are of interest in the study of torsional vibrations of axially symmetric rods.

*I. S. Sokolnikoff.*

*JP*

L 18722-66 EWT(1)

ACC NR: AP6005091

SOURCE CODE: UR/0251/65/040/003/0671/0676

AUTHOR: Razmadze, G. N.

ORG: Georgian Institute of Subtropical Management, Sukhumi (Gruzinskiy institut subtropicheskogo khozyaystva)

TITLE: Determining the propagation rates of flexural harmonic waves

SOURCE: AN GruzSSR. Soobshcheniya, v. 40, no. 3, 1965, 671-676

TOPIC TAGS: structural engineering, free oscillation, propagation velocity, bending stress, flexural vibration

ABSTRACT: It is shown that on the basis of the theory of structural dynamics it is possible to derive the initial formula for obtaining practical quantitative formulas giving the numerical values of the propagation rates of flexural harmonic waves of various length. Thus, the equations of free, harmonic oscillations of beam systems can be satisfied by means of the substitution

$$y(z, t) = y(z) \cdot e^{i\omega t}, \quad (1)$$

where  $y(z)$  is the form of oscillations,  $i$  is an imaginary number,  $\omega$  is the circular

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ACC NR: AP6005091

frequency of oscillations, and  $t$  is the time. The special feature of substitution (1) lies in that  $y(z)$  recurs periodically for specific discrete values of  $t = \tau$ , i.e. we have

$$y(z, \tau) = y(z) \cdot e^{i\omega\tau} = y(z) \quad (2)$$

thus ultimately deriving

$$a = \frac{\lambda}{2\pi} \cdot \omega, \quad (3)$$

where  $a$  is the propagation rate of the waves of a flexure of length  $\lambda$ . On the basis of this formula the authors present several practical examples of the derivation of final engineering formulas for the propagation rates of flexural waves. These examples pertain to: natural oscillations of a regular beam whether rigidly or elastically supported, as well as transverse oscillations of a hinged beam in the presence of a constant longitudinal axial stress. It is interesting to note that formula (3) coincides with the known results of the theory of electromagnetic harmonic waves (B.M. Yarovskiy, A. A. Detlaf. Spravochnik po fizike. Gosizdat, Moscow, 1963). Hence formula (3) has a universal character and it enables structural dynamics to

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ACC NR: AP6005091

0  
determine the magnitude of the propagation rates of both flexural and torsional waves (on replacing in the latter case the factors  $a$  and  $\omega$  with others --  $b$  and  $\Omega$ ). Orig. art. has: 19 formulas.

SUB CODE: 12, 13, 20/ SUBM DATE: 10Dec64/ ORIG REF: 003/ OTH REF: 001

Card 3/3 *S/M*

1-8822-65 ENT(n)/ENP(w)/ENP(v)/ENP(k) Pt 4 EM

ACCESSION NR: AR5009489

S/0124/65/000/003/V024/V024

SOURCE: Ref. zh. Mekhanika, Abs. 3V163

AUTHOR: Razmadze, G. N.

TITLE: An engineering solution to the problem of the propagation of flexural and torsional waves in beam columns <sup>26</sup>

CITED SOURCE: Tr. Gruz. in-ta subtrop. kh-va, v. 7-8, 1963, 309-312

TOPIC TAGS: beam column, flexural wave, torsional wave, wave propagation rate, cross section roll

TRANSLATION: Expressions defining the rates of propagation of flexural and torsional waves are evolved from steady-state solutions to equations for flexural-torsional oscillations of beam columns which consider the roll of cross sections (V. Z. Vlasov). The expression obtained for the rate of propagation of flexural waves in a rod with a circular cross section was compared with the data of Hudson-Timoshenko. The author notes that the obtained "... results fall in between basic and very exact theories". Ye. I. Shemyakov

SUB CODE: ME, *as*

ENCL: 00

Card 1/1

BERODZE, Z.I.; RAZMADZE, G.N.

Some results of calculating the total strain of the structure  
taking into account repeated elastic impacts. Soob. AN  
Gruz. SSR 27 no.6:715-719 D '61. (MIRA 15:2)

1. Institut subtropicheskogo khozyaystva, Sukhumi. Predstavleno  
akademikom K.S.Zavriyevym.  
(Impact)



RAZMADZE, G.N.

On the problem of percussion torsion of a round shaft having a variable  
cross section. Soob.AN Gruz.SSR 14 no.2:91-94 '53. (MLRA 7:5)  
(Torsion)

AVALIANI, V.L. [deceased]; RAZMADZE, G.S.; TATISHVILI, Ye.M.

Physicomechanical properties of the "wood" of moso, madake, and Chinese madake bamboo stalks. Report no. 1. Izv. AN Arm. SSR. Biol. i sel'khoz. nauki 4 no. 6:563-573 '51. (MLRA 9:8)

1. Gruzinskiy ordena Trudovogo Krasnogo Znameni sel'skokhozyaystvennyy institut imeni L.P. Beriya, Tbilisi.  
(Bamboo)

AVALIANI, V.L. [deceased]; RAZMADZE, G.S.; TATISHVILI, Ye.M.

Physicomechanical properties of the "wood" of moso, madake, and Chinese makade bamboo stalks. Report no. 2. Izv.AN Arm.SSR.Biol.1 sel'khoz.nauki. 4 no.7:675-687 '51. (MLRA 9:8)

1. Gruzinskiy Ordena Trudovogo Krasnogo Znameni sel'skokhozyaystvennyy institut imeni L.P. Beriya, Tbilisi.  
(Bamboo)

RAZMADZE, K.R.

Materials on aphids parasitic on vegetable crops in Kartlia. Soob.  
AN Gruz. SSR 24 no.6:717-722 Je '60. (MIRA 13:9)

1. Akademiya sel'skokhozyaystvennykh nauk GruzSSR, Institut semledel'-  
chestva, Saguramo. Predstavleno chlenom-korrespondentom Akademii  
L.P.Kalandadze.  
(Kartlia-Plant lice) (Vegetables—Diseases and pests)

RAZMADZE, K.S.

Zonal distribution of *Aphis fabae* Scop. in Georgia. Vop. ekol.  
7:151 '62. (MIRA 16:5)

1. Nauchno-issledovatel'skiy institut zemledeliya, Saguramo,  
Gruzinskoy SSR.

(Georgia—Plant lice)

RAZMADZE, K.S.

Study of comparative toxicity and the duration of the action of  
some systemic preparations. Soob. AN Gruz. SSR 29 no.5:587-594  
N '62. (MIRA 18:3)

Nauchno-issledovatel'skiy institut zemledeliya GruzSSR, Saguramo.  
Submitted December 14, 1961.

RAZMADZE, N. A., DZIMISTARISHVILI, O. D., OSHEROVICH, A. L., and RODIONOV, S. F.

"Stellar Electric Photometer With Photomultiplier," byull. Abastumansk. astrofiz. observ., No 16, 1954, pp 3-7

Tentative results of testing the stellar photometer with photomultiplier (FEU) assembled according to the design by A. L. Osherovich, Ye. N. Pavlova, and others (Zh. tekhn. fiziki, 1949, 19, 184) are presented. The sensitivity of the photometer allows use of the 33 cm reflector with or without filters up to 9th magnitude stars. (RZhAstr, No 4, 1955)

SO: Sum. No. 568, 6 Jul 55

DZIMISTARISHVILI, O.D.; OSHEROVICH, A.L.; RAZMADZE, N.A.; RODIONOV, S.F.

Stellar electrophotometer with photo-multiplier. Dokl. AN SSSR 95  
no. 5:955-956 Ap 1954. (MLRA 7:4)

1. Leningradskiy gosudarstvennyy universitet im. A.A. Zhdanova  
Abastumanskaya astrofizicheskaya observatoriya Akademii nauk Gruz. SSR.  
Predstavleno akademikom A.A. Lebedevym. (Photometry, Astronomical)



MAGALAZHVILI, N.L.; RAZMADZE, N.A.

Electrophotometric observations of the eclipsing variable V  
505 Sagittarii. Per. zvezdy 10 no.5:313-317 '55. (MLRA 9:9)

1. Abastumanskaya astrofizicheskaya observatoriya.  
(Stars, Variable)

**RAZMADZE, N.A.**

Study of the diffuse Orion nebula and planetary nebulae based on photoelectric observations. Soob. AN Gruz. SSR 17 no.7:599-605 '56.  
(MIRA 9:11)

1. Akademiya nauk Gruzinskoy SSR, Abastumanskaya astrofizicheskaya observatoriya. Predstavleno chlenom-korrespondentom Akademii Ye. K. Kharadze.

(Nebulae) (Photoelectric measurements)

MAGALASHVILI, N.L.; KUMSISHVILI, Ya.I.; RAZMADZE, N.A.

Photoelectric observations of the spectroscopic binary BD +  
39°811 [with summary in English] Biul. Abast. astrofiz.  
obser. no.20:11-15 '56. (MLRA 9:12)

(Stars, Double) (Photoelectric measurements)

Photoelectric observations of planetary nebulae and the diffuse nebula in Orion. N. A. Razumidze *Astrophys. Observatory, Abastumani, Armenia* *Publ. No. 10, 1953* — The brightnesses of the H $\beta$  and H $\gamma$  lines and the nebular lines N $\gamma$  and N $\delta$  of O III were detd. with a sensitive photoelec. photometer for 8 planetary nebulae and for 9 regions of the diffuse Orion nebula. It was assumed that the nos. of protons  $n_H$  and of free electrons  $n_e$  in 1 cc. are the same in nebulae transparent to the Balmer series of H. The transition  $^1D_2 - ^1P$  was used to calc., with Menzel's formula, the no. of O III atoms ( $n_{OIII}$ ) per cc. in the level  $^1P$ . Electron temps. of the nebulae and their lower mass-limits are given. The following results were obtained:  $n_H = n_e$  for planetary nebulae varies between  $2.26 \times 10^4$  and  $5.3 \times 10^4$ ; and the O III concn. for this same nebulae varies between  $3.72 \times 10^{-4}$  and  $6.92 \times 10^{-4}$ . For the Orion nebula  $n_H = n_e$  was from  $0.87 \times 10^5$  to  $2.14 \times 10^5$  and  $n_{OIII}$  from  $0.49 \times 10^{-4}$  to  $2.33 \times 10^{-4}$ . The results for the concn. of  $n_e$  are in good agreement for different nebulae with those of Liller and Aller (*Astrophys. J.* 120, 48(1954)). The electron d. and the concn. of O III were 2.5 and 4 times greater, resp., in the planetary nebulae than in the Orion nebula. With the same app. the polarization of the light in NGC 2242 and BD-18°2030 was measured as 5% and 3%, resp.

R. Zalubas

RAZMADZE, N.A.

Photometry of the planetary nebula NGC 6853 ("Dumbbell").  
Astron.zhur. 33 no.5:698-707 S-O '56. (MLRA 9:12)

1. Abastumanskaya astrofizicheskaya observatoriya Akademii  
nauk Gruzinskoy SSR.  
(Nebulae) (Photometry, Astronomical)

MAGALASHVILI, N.L.; KUMSISHVILI, Ya.I.; RAZMADZE, N.A.

Electrophotometry of spectral binary BD-39°811. Astron.tsir.  
no.166:21 Ja '56. (MIRA 9:7)

1.Abastumanskaya astrofizicheskaya observatoriya AN Gruzinskoy SSR.  
(Stars, Double)

RAZMADZE, N. A., Cand Phys -Math Sci -- (diss) "Photoelectric  
Photometry of ~~the~~ Sharp Planetary and Diffuse Gaseous ~~Nebulo~~<sup>Foggy ones.</sup>  
~~sities.~~" Tbilisi, Publication of Acad Sci ~~USSR~~<sup>Georgian</sup> SSR, 1957.  
6 pp (Min of Higher Education USSR, Yerevan State Univ), 100  
copies (KL, 51-57, 91)

- 5 -

307/35-59-11-8885

Translation from: Referativnyy zhurnal, Astronomiya i Geodeziya, 1959, Nr 11, p 28,  
(USSR)

AUTHOR: Razmadze, N.A.

TITLE: Electrophotometry of Bright Planetary and Diffuse Gas Nebulae

PERIODICAL: Byul. Abastumansk. astrofiz. observ. 1958, Nr 23, pp 91 - 156 (Engl.  
résumé)

ABSTRACT: In the first chapter a detailed survey of all the research in this field is given. In the 2nd chapter, there is a description of observational equipment with an electrophotometer. In the 3rd chapter there is an account of observations with filters of 11 planetary and two diffuse nebulae. The spatial distribution of densities in NGC 6523 has been studied. Comparisons are being made between the measurements and calculations compiled by other authors, and the possible calculation errors are being estimated, which are due to insufficient knowledge of the supplementary data. The basic contents of the present work have been printed earlier as separate articles. (RZhAstr, 1957, Nr 2, 1183, Nr 5, 3603.) Bibl. 74 titles.

B.A. Vorontsov-Vel'yaminov

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KAPLANYAN, M.A.

PHASE I BOOK EXPLOITATION

SOV/4798

Akademiya nauk Armyanskoy SSR, Yerevan. Byurakanskaya observat ya

Soobshcheniya, vyp. 26 (Communications of the Byurakan Observatory of the Academy of Sciences of the Armenian SSR, No. 26) Yerevan, 1959. 82 p. 700 copies printed.

Resp. Ed.: Viktor Amazaspovich Ambartsumyan; Tech. Ed.: M.A. Kaplanyan.

PURPOSE: This publication is intended for astronomers and astrophysicists.

COVERAGE: This issue of the Communications of Byurakan Observatory contains articles dealing with the properties of stellar associations in spiral galaxies, investigations of planetary nebulae, and the instruments and techniques used in photometry. No personalities are mentioned. References follow each article.

TABLE OF CONTENTS:

Markaryan, B. Ye. Color and Radiance of Bright Stellar Associations of the Spiral Galaxies M51 and M101

3

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Communications of the Byurakan Observatory (Cont.)

SOV/4798

Gurzadyan, G.A., and N.A. Razmadze. Polarimetric Investigation of the Planetary Nebula NGC 7026 19

Arakelyan, M.A. Remarks on the Photometric System U, B, V 27

Mirzoyan, L.V., and E. Ye. Khachikyan. Investigation of the Comet Mrkos (1957 d.) I 35

Markaryan, B. Ye. Characteristic Features of the Distribution of Open Clusters in the Galaxy Plane 53

Gurzadyan, G.A. Magnetic Drag in the Planetary Nebulae 59

Gurzadyan, G.A. Observations on One Application of the Electrophotometric Planimeter 77

The author describes a new method of using an electrophotometric planimeter in the processing of microphotograms. The operating principle of this device is based on the measurement of the stream of light equivalent to the given plane. The advantage of this instrument, besides the simplicity and quickness of its operation, is its high precision (measurement error less than 1%) which, moreover, does not depend on the form and size of the measured surface. The efficiency of the proposed method may be increased

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Communications of the Byurakan Observatory (Cont.)

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by using two sighting slits with different apertures consecutively, in order to reduce the fluctuation of background brightness. The method of two sighting slits can also be used in other fields of photometry, particularly in measuring star brightness by means of electrophotometry.

AVAILABLE: Library of Congress

Card 3/3

JA/dwm/mas  
2-27-61

87250  
S/033/60/037/006/009/022  
E032/E514

3.6710 (100-100, 1177)

AUTHOR:

Razmadze, N. A.

TITLE:

PERIODICAL: *Astronomicheskiy zhurnal*, 1960, Vol.37, No.6,  
pp. 1005-1007

TEXT:

The 70-cm meniscus telescope of the Abastuman Astrophysical Observatory, which incorporated an objective prism, was used to obtain a series of spectrograms of faint planetary nebulae having the following numbers in Vorontsov-Vel'yaminov's "Catalogue of Planetary Nebulae": 2,5,3,129,223,230,237,238,240,266, and also spectrograms of the planetary nebula NGC 6884. The linear dispersion produced by the objective prism in the primary focus of the above telescope was 166 Å/mm in the neighbourhood of H. Kodak 0a0 and Ilford-Zenith plates were used with half-hour exposures in the majority of cases. The star ε Per was used as the standard star, since the distribution of energy in its spectrum is well known (Refs. 2 and 3). The star was photographed with strongly diaphragmed entrance aperture of the telescope, using exposures of 3 to 10 min. Knowing the energy distribution in

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E032/E514

# Spectrophotometry of Faint Planetary Nebulae

this star and correcting for atmospheric attenuation in accordance with the data of Kalandadze (Ref.4) and Dolidze (Ref.5), a correction was made in the sensitivity of the apparatus, including the photographic plate. The final data obtained are given in Table 1. This table gives the intensities of bright emission lines of the nebulae in the wavelength range 3700 to 5000 Å. The intensities of some 25 lines are quoted. The following table gives the electron temperatures  $T_e$  of the nebulae which were calculated from the intensity ratios of the [OIII] lines  $\lambda\lambda$  4363, 4959, 5007 using the well known formula:

$$\frac{I(\lambda 4959 + \lambda 5007)}{I(\lambda 4363)} = 8.74 e^{3300/T_e}$$

No. of nebula	$T_e$ °	No. of nebula	$T_e$ °	Table 2	
				No. of nebula	$T_e$ °
2	9400	223	-	240	16500
5	20 300	230	17600	260	10200
8	-	237	22800	NGC 6884	14400
129	21200	238	12400		

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E032/E514

### Spectrophotometry of Faint Planetary Nebulae

In the case of nebula No.8, the above formula does not apply, since it does not take into account collisions of the second kind, which in this particular case are important. Inspection of Table 1 shows that the above nebulae are highly excited objects. This is indicated by the presence of the line  $\lambda$  4686 [HeII] and the relatively strong line  $\lambda$  3869 [NeIII] in the spectra of the large nebulae. Apart from the nebula No.8, which is apparently super-dense (Razmadze, Ref.8), the following objects are noticeable. The planetary nebula No.129 emits strong lines on  $\lambda$  3727 [OII] and  $\lambda$  4686 [HeII]. This indicates a high degree of excitation of the medium. The simultaneous presence of these two lines in the spectrum of the nebula suggests strong stratification of matter with respect to the degree of excitation. In the case of nebula No.230, the lines [SII]  $\lambda$  4069 and  $\lambda$  4076 have high intensities. Their presence may indicate a very low degree of excitation in the nebula. This is somewhat contradicted by the absence in the spectrum of the line  $\lambda$  3727 [OII], which also characterizes low degree of excitation and the presence of a strong  $\lambda$  3869 [NeIII] which suggests a high

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EO32/E514

Spectrophotometry of Faint Planetary Nebulae

degree of excitation. The spectrum of the nebula No.237 shows relatively strong lines of [HeI] ( $\lambda\lambda$  4026, 4143, 4388 and 4472). This may indicate the presence of excess helium in this object. There are 2 tables and 8 references: 6 Soviet (1 a translation from English), 2 non-Soviet.

ASSOCIATION: Abastumanskaya astrofizicheskaya observatoriya  
(Abastuman Astrophysical Observatory)

SUBMITTED: April 5, 1960

Card 4/4

RAZMADZE, N.A.

Superdense planetary nebula. Astron.tsir. no.209:20-21 Mr '60.  
(MIRA 13:9)

1. Abastumanskaya astrofizicheskaya observatoriya.  
(Nebulae)



RAZMADZE, N.A.

Spectrophotometry of faint planetary nebulae. Biul.Abast.-  
astrofiz.obser. no.26:25-33 '61. (MIRA 15:3)  
(Nebulae--Spectra)

STARTSEV, V.T.; RAZMAKHANIN, S.L.; YEGOROVA, V.M.; PASHANOVA, L.D.; YEVSEYEV, V.R.; BASTIN, K.F.; BELOBORODOV, P.P.; DEDOV, N.D., red.

[Economy of Amur Province; a statistical manual] Narodnoe khoziaistvo Amurskoi oblasti; statisticheskii sbornik. Blagoveshchensk, Amurskoe knizhnoe izd-vo 1957. 111 p. (MIRA 11:6)

1. Amur (Province). Oblastnoye statisticheskoye upravleniye. 2. Statisticheskoye upravleniye Amurskoy oblasti (for all except Beloborodov, Dedov). 3. Nachal'nik Statisticheskogo upravleniya Amurskoy oblasti (for Beloborodov)  
(Amur Province--Statistics)

0924 1664

ACC NR: AP7008868

SOURCE CODE: UR/0105/66/000/008/0095/0095

AUTHOR: Abelishvili, L. G.; Al'tgauzen, A. P.; Baycher, M. Yu.; Gabashvili, N. V.; Dididze, M. S.; Yefroymovich, Yu. Ye.; Kotiya, A. K.; Kupradze, G. D.; Kurdiani, I. S.; Notushili, A. V.; Nikol'skiy, L. Ye.; Razmadze, Sh. M.; Sventchanskiy, A. D.; Smelyanskiy, M. Ya.; Tkeshelashvili, G. K.

ORG: none

TITLE: Professor Grigoriy Artemyevich Sisoyan (on his 70th birthday)

SOURCE: Elektrichestvo, no. 8, 1966, 95

TOPIC TAGS: electric engineering personnel, electric furnace, academic personnel

SUB CODE: 09

ABSTRACT: G. A. Sisoyan graduated from the Moscow Power Engineering Institute in 1931. In 1932 he went to work at the Georgian Polytechnical Institute in the theoretical and general electrical engineering department. Sisoyan has worked and published many works in the area of electric furnaces. He has also worked in the area of investigation of electric spark action. He has published over 50 scientific works. He has also been active in university level teaching. Orig. art. has: 1 figure. [JPRS: 38,330]

UDC: 621.36

Card 1/1

RAZMADZE, Sh.M.; LOMINADZE, V., spets.red.; GOGESHVILI, E.,  
red.izd-va; SAGARADZE, Sh., tekhn.red.

[Electromagnetic processes in systems with large converting  
devices] Elektromagnitnye protsessy v sistemakh s moshchnymi  
preobrazovatel'nymi ustanovkami. Tbilisi, Izd-vo Gruzinskogo  
politekhn.in-ta im. V.I.Lenina, 1960. 275 p.

(MIRA 14:4)

(Electric current rectifiers)

POSSE, A.V. (Leningrad); RAZMADZE, Sh.M. (Tbilisi)

Parallel operation of six-phase rectifier units with transformers  
connected in the following fashion: Y - two inverted Y's, and -  
two inverted Y's. Izv. AN SSSR. Otd. tekhn. nauk. Energ. i avtom.  
no. 4:17-28 J1-Ag '60. (MIRA 13:8)

(Electric current rectifiers)  
(Electric railroads--Substations)

RAZMADZE, Sh.M.; LOMINADZE, V., red.; GOGESHVILI, I., red.izd-va;  
KATSITADZE, A., tekhn. red.

[Three-phase current rectification] Vypriamlenie trekhfaz-  
nogo toka. Tbilisi, Gos.izd-vo "TSodna" M-va kul'tury  
Gruzinskoi SSR, 1963. 255 p. (MIRA 16:12)  
(Electric current rectifiers)

PHASE I BOOK EXPLOITATION SOV/5456

Razmadze, Sh. M.

Elektromagnitnyye protsessy v sistemakh s moshchnymi preobrazovatel'nymi ustanovkami (Electromagnetic Processes in Systems With High-Power Conversion Units) Tbilisi, Izd-vo Gruzinskogo politekhn. in-ta im. V. I. Lenina, 1960. 275 p. Errata slip inserted. 2,000 copies printed.

Sp. Ed.: V. Lominadze; Ed. of Publishing House: E. Gogeshvili; Tech. Ed.: Sh. Sagaradze.

PURPOSE: This book is intended for engineers and specialists studying the theory of current rectification. It may also be used in designing converter sub-stations and separate units for computing their control equipment, and in their operation.

COVERAGE: The book presents the results of an analysis of electromagnetic processes in jointly operating rectifier units, taking into account mutual interference of these units. Normal as well as extreme steady-state operating regimes, from no-load to short-circuit conditions, are discussed in detail. No personalities are mentioned. There are 68 references: 59 Soviet (including 1 translation), 8 English, and 1 German.

Card-1/5

1. RAZADZE, T. S.
2. USSR (600)
4. Solar Radiation
7. Radio-frequency radiation of the sun and chromosphere formations, Astron. tsir., No. 12, 1951.
9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.



RAMADZI, T. S.

"Revelation of Solar Activity in Eruptions," Izv. Abastumansk, astrofiz. observ., No 16, 1954, pp 52-147

The study of eruptions lead the author to the conclusion that the frequency of eruptions varies with the phase of cycle. Cyclic curves of eruptions and of spots have similarity; however, secondary surges are most conspicuous in the eruption curve. The latter shows asynchronic development of eruptions in the northern and southern hemispheres. A close relation between solar eruptions and radicemission is confirmed. (BzhAstr, No 4, 1955)

SC: Sum. No. 548, 6 Jul 55

RAZMADZE, T.S.

Spectroheliographic observations at Mount Kanobili from 1951  
to 1953. Biul. Abast. astrofiz. obser. no.19:25-131 '55.

(MLRA 9:12)

(Sun)

RAZMADZE, T.S.

Statistics of spectrohelioscopic observations [in Georgian].  
Biul.Abast.astrofiz.obser. no.22:103-112 '58. (MIRA 11:12)  
(Sun--Spectra)

RAZMADZE, T.S.

Chromospheric flare characteristics [in Georgian]. Biul. Abast.  
astrofiz. obser. no. 22:113-115 '58. (MIRA 11:12)  
(Sun)

23943

S/035/61/000/006/027/044  
A001/A101

3,1540

AUTHOR: Razmadze, T.S.

TITLE: The chromospheric flare of March 29, 1960

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 6, 1961, 51-52,  
abstract 6A421 ("Solnechnyye dannyye", 1960, no. 7, 68 - 73)

TEXT: The author reports on an observation of a 2+ chromospheric flare associated with a rapidly varying group of sunspots. The flare was very extended and was associated with dark ejections and intense radio emission. The flare had many centers with shifted phases of brightness development. Photometric curves of development of three flare centers are presented. During the brightness maximum of the main center, a filament arose in the flare region having a tangential speed of 260 km/sec. Varying rapidly, extending and widening, it attained a maximum speed of 520 km/sec after which it remained of the same dimensions during a few minutes. Later on, the filament began to bifurcate, break to pieces and disintegrate. According to measurements the filament length had 2 maxima, i.e., as if the filament pulsated. The graph of variations of the filament length and width is presented. The emergence of a second filament is noted, which was not

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The chromospheric flare of March 29, 1960

2394<sup>3</sup> S/035/61/000/006/027/044  
A001/A101

as intensive and varied less actively. The development of an active sunspot group associated with the given flare is described. At a frequency of 209 Mc was recorded the maximum flux of  $1,10^4 \times 10^{-22}$  w/Mc. It is noted that the maximum of radio emission took place an hour after the maximum of flare brightness.

V. Yesipov

[Abstracter's note. Complete translation]

Card 2/2

L 37690-66 EWT(1)/FCC GW

ACC NR: AT6017164

(N)

SOURCE CODE: UR/2501/65/000/032/0111/0116

AUTHOR: Razmadze, T. S.

ORG: none

TITLE: Solar flares and the night sky light ✓

SOURCE: Abastumani. Astrofizicheskaya observatoriya. Byulleten', no. 32, 1965, 141-146

TOPIC TAGS: solar activity, solar activity curve, solar flare, solar radio emission, spectral line, astronomic observatory

ABSTRACT: The relationship between solar activity and the illumination of the night sky is investigated. The work was done because previous results have been contradictory. The data were taken from the International Collection of resumé of electrophotometric observations of the night sky light of all stations of the earth during the IGY and IGC. The average monthly and semiannual values for both the mean night intensities and their maximal values were calculated for emissions of 5577 Å [OI], 5893 Å [Na], 6300 Å [OI], and 6500 Å [OH]. The data on solar flares were taken from the Zurich Bulletins. It was found that variations in the intensity of the illumination of the night sky do not correspond to fluctuations in flare activity. It is concluded that solar flares do not play a marked role in fluctuations in the

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L 37690-66

ACC NR: AT6017164

intensities of the emission lines studied by the author. The author thanks L. M. Fishkova for valuable discussion. Orig. art. has: 4 graphs.

SUB CODE: 03/

SUBM DATE: none/

ORIG REF: 003/

OTH REF: 002

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RAZMADZE, T.S.; COGOASHVILI, N.Z.

Development of chromospheric flares. Biul. Abast. astrofiz. obser.  
32:123-139 '65. (MIRA 18:10)

RAZMADZE, T.S.

Solar flares and night airglow. Biol. Abstr. astrofiz. obser. 32:  
141-146 '65. (MIRA 18:10)

ACCESSION NR: AT3012979

S/2501/62/000/029/0003/0027

AUTHOR: Razmadze, T. S.

TITLE: Photometry of chromospheric flares

SOURCE: Abastumani. Astrofizich. observatoriya. Byul., no. 29, 1962.  
Issledovaniya po programme MGG i mezhdunarod. geofiz. sotrudnichestva, 3-27

TOPIC TAGS: photometry, chromosphere, chromospheric flare, chromosphere telescope  
AFR 2, aerophotographic film T 10 800, microphotometer MF 2, photocell FESS U 2

ABSTRACT: The author discusses the results of photometric treatment of twelve large flares observed at the Abastumanskaya astrofizicheskaya observatoriya (Abastumani Astrophysical Observatory) during the second half of 1958. Observations were made with an AFR-2 chromosphere telescope by means of a movie camera and an interference-polarizing light filter with a wide-band pass of 0.5 Å for the H $\alpha$  line. Photographs were made on T-10-800 aerophotographic film. The photometric measurements were made with an MF-2 microphotometer. An FESS-U-2 photocell was attached to the microphotometer to increase sensitivity (integral sensitivity of 6500 ma/lumen). Each flare is described, distinguished from each other by

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ACCESSION NR: AT3012979

characteristic development of total duration, by their distribution relative to spots and filaments, by their connection with dark surges, by their structure, and by still other features. All the flares were connected with rapidly changing groups of spots that were either in a stage of development or in a stage of decay. Areas of the flares changed approximately in proportion to change in brightness, though some showed a slight lag in time. The average duration of growth proved to be 12 minutes for main centers, 7 minutes for subcenters, and the average decay period was 24 minutes for main centers, 21 minutes for subcenters. The average rate of change of intensity (change in intensity divided by time change) was 0.218 for main centers of flare growth, 0.052 for decay. Corresponding rates for subcenters were 0.104 and 0.038. Orig. art. has: 12 figures and 3 tables.

ASSOCIATION: Abastumanskaya astrofizich. observatoriya (Abastumani Astrophysical Observatory)

SUBMITTED: 00Feb60

DATE ACQ: 15Oct63

ENCL: 00

SUB CODE: AA

NO REF SOV: 005

OTHER: 002

Card 2/2

S/2501/62/000/029/0029/0045

ACCESSION NR: AT3012980

AUTHORS: Razmadze, T. S.; Tskhovrebadze, A. S.

TITLE: Developmental curves of solar flares

SOURCE: Abastumani. Astrofizich. observatoriya. Byul., no. 29, 1962.  
Issledovaniya po programme MGG i mezhdunarod. geofiz. sotrudnichestva, 29-45

TOPIC TAGS: chromosphere, solar flare, telescope AFR 2

ABSTRACT: This paper consists almost wholly of a set of curves showing the growth and decay of the nine largest flares observed in 1959 at the Abastumanskaya observatoriya (Abastumani Observatory). Data were obtained by means of the AFR-2 chromospheric-photospheric telescope with a polarizing-interference light filter having a band pass of 0.5 Å in the H $\alpha$  line. The method of photometric treatment has been described by T. S. Razmadze in the preceding article of the present bulletin (pp. 3-27). The graphs show duration, intensity, and area. When two centers were observed in a single flare, the intensity and area of each were plotted, but when the centers were difficult to differentiate, the values for all centers taken together were plotted. Orig. art. has: 14 figures and 1 table.

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Card

RAZMADZE, T.S.; TSKHOVREBADZE, A.S.

Curves of the development of chromospheric flares. Bul.  
Abast. astrofiz. obser. no.29:29-45 '62. (MIRA 16:4)

(Solar flares)

MARTIANASHVILI, Sh. M.; NANOASHVILI, D.I.; RAZMADZE, Z.G.

Possibility of transmutation alloying of indium and monide. Fiz.  
tver. tela 7 no. 12:3566-3570 D '65 (NIRA 19:1)

1. Tbilisskiy gosudarstvennyy universitet.

MIRIANISHVILI, Sh.M.; NANOBASHVILI, D.I.; RAZMADZE, Z.G.

6 -irradiation of indium antimonide. Soob. AN Gruz. SSR 38  
no.1:53-58 Ap '65. (MIRA 18:12)

1. Tbilisskiy gosudarstvennyy universitet. Submitted Nov. 12,  
1964.



L 18725-66 EXT(m)/EPF(n)-2/T/EMP(t) IJP(o) JD/GG  
 ACC NR: AP6005089 SOURCE CODE: UR/0251/65/040/003/0589/0595

AUTHOR: Mirianashvili, Sh. M.; Nanobashvili, D. I.; Razmadze, Z. G.

ORG: Tbilissi State University (Tbilisskiy gosudarstvennyy universitet)

TITLE: Low-temperature irradiation of indium antimonide with fast neutrons

SOURCE: AN GruzSSR. Soobshcheniya, v. 40, no. 3, 1965, 589-595

TOPIC TAGS: neutron irradiation, antimonide, indium compound, fast neutron, electric conductivity, lattice defect

ABSTRACT: Monocrystalline specimens of InSb were irradiated with fast neutrons at 100-300°K in a low-temperature horizontal channel of the reactor of the Institute of Physics, Academy of Sciences Georgian SSR, with continuous measurement of electric conductivity of the specimens. It was found (Fig. 1) that the decrease in the electric conductivity of InSb specimens of the n-type at the initial moment of irradiation occurs at a constant rate and is a linear function of the fast neutron flux. As the time of irradiation increases, however, owing to annealing and recombination of defects, the rate of variation in electric conductivity decreases. The minimal value toward which tends the conductivity of specimens of the n-type following prolonged irradiation is, contrary to the findings of W. Cleland and J. H. Crawford (Neutron Irradiation of Indium Antimonide. Phys. Rev., 95, 1954, 1177), on irradiation with

Card 1/3

L 14121-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD

ACC NR: AP6000855

SOURCE CODE: UR/0181/65/007/012/3566/3570<sup>52</sup>

AUTHORS: Mirianashvili, Sh. M.; Nanobashvili, D. I.; Razmadze, Z. G.<sup>B</sup>

ORG: Tbilisi State University (Tsilisski gosudarstvennyy universitet)

TITLE: On the possibility of transmutational doping of indium antimonide<sup>21</sup>

SOURCE: Fizika tverdogo tela, v. 7, no. 12, 1965, 3566-3570

TOPIC TAGS: neutron irradiation, neutron absorption, indium compound, antimonide, impurity conductivity, Hall constant

ABSTRACT: Results are presented of irradiation of indium antimonide with slow neutrons. Although the total cross section for the absorption of thermal neutrons is known for the components in InSb, theoretical calculations are made difficult by lack of data on the properties of the different impurities in the binary A<sup>III</sup>B<sup>V</sup> compounds. The measurements were made on n-type InSb with initial impurity atom (donor) concentration  $3.37 \times 10^{13}$  --  $6.17 \times 10^{15} \text{ cm}^{-3}$ , and p-type with

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L 14121-66

ACC NR: AP6000855

acceptor concentration  $2.93 \times 10^{14}$  --  $4.57 \times 10^{17} \text{ cm}^{-3}$ . The irradiation was effected in the experimental channels of the reactor of the Institute of Physics of the Academy of Sciences of the Georgian SSR at temperatures 100 and 300K. The results show that it is possible to introduce by means of neutron transmutation donor impurities (Sn and Te) into InSb in any desired amount. The final conductivity of the InSb sample after annealing is governed by the balance between the carriers present in the sample prior to irradiation and the carriers produced as a result of the transmutational doping. Irradiation causes the Hall constant to behave in the same manner as for an ordinary substitutional semiconductor. It is pointed out that irradiation aimed at producing additional scattering centers has a tendency to reduce the mobility of the carriers. This effect depends on the initial concentration of the free carriers, on the degree of compensation of the samples, and on other factors. For samples with carrier density less than  $10^{16} \text{ cm}^{-3}$  the decrease in mobility does not exceed 10 -- 15 per cent for fluxes up to  $10^{16} \text{ neut/cm}^2$ . Orig. art. has: 3 figures, 5 formulas, and 2 tables.

SUB CODE: 20/ SUBM DATE: 10JUN65/ OTH REF: 004

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L 18725-66

ACC NR: AP6005089

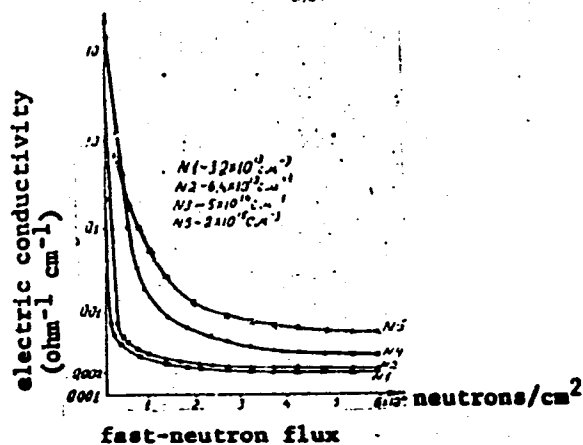


Fig. 1. n-Type conductivity of InSb as a function of fast-neutron flux at the temperature of 1100°K

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L 18725-66

ACC NR: AP6005089

fast neutrons at room temperature, not common to all specimens but depends on the initial donor concentration  $N_d$ , decreasing with decreasing  $N_d$  (the specimens investigated had an initial  $N_d$  of  $\approx 3.2 \times 10^{13} \div 2 \times 10^{15} \text{ cm}^{-3}$  and acceptor concentration  $N_a$  of  $\approx 1.9 \times 10^{14} \div 1.6 \times 10^{17} \text{ cm}^{-3}$ , inclusive of specimens of the p-type with a thermoacceptor concentration of  $1.9 \times 10^{14} \text{ cm}^{-3}$  and  $1.62 \times 10^{15} \text{ cm}^{-3}$ , obtained by vacuum annealing). Fast-neutron irradiation is bound to cause in equal quantities two types of disorders of the crystalline lattice of the semiconductor: vacancies and interstitial atoms. This complicates the picture of the energy levels of the defects owing to the appearance in the forbidden zone of InSb of levels associated with the first and second ionization potentials of vacancies and intermediate atoms. The concentration of current carriers in specimens of both n- and p-types was found to sharply decrease on irradiation. This shows that low-temperature irradiation of InSb produces donor and acceptor levels located sufficiently deeply in the forbidden zone so that electric conductivity decreases. The annealing of radiation damage in the temperature range of 100-300°K confirms the author's assumption that acceptor levels get annealed much more intensively than donor levels. Orig. art. has: 2 figures, 1 table.

SUB CODE: 11, 13, 18, 20/ SUBM DATE: 30Jan65/ ORIG REF: 002/ OTH REF: 001

Card 3/3 500

L 5071-66

ACC NR: AP5022636

EWT(m)/EWP(t)/EWP(b)/EWA(h)

IJP(c) JD/DM

UR/0089/65/019/002/0176/0177  
621.039.573

2

33

B

AUTHOR: Kiknadze, G. I.; Gambaryan, V. G.; Litvinov, B. I.;  
Lyudvigov, R. B.; Razmadze, Z. G.; Fel'dman, L. I.; Chanturiya, V. M.

TITLE: Indium-gallium radiation loop for pool-type reactors

SOURCE: Atomnaya energiya, v. 19, no. 2, 1965, 176-177

TOPIC TAGS: nuclear research reactor, gamma radiation

ABSTRACT: An abbreviated description of a special indium-gallium loop used in the IRT-2000 research reactor is given. The reactor is operated by the Institute of Physics of the Gruzinskaya SSR Academy of Sciences. The loop does not require a special biological shielding and can be easily manipulated and adjusted to other pool-type reactors. The changes in gamma dose rates are obtained by a translational displacement of the loop frame. The radioactive  $In^{116}$  nuclei are generated by leakage neutrons. A radioactivity equivalent to 16 g of radium can be created at a 1000 kw capacity. Thus, a gamma dose rate of about

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L 10355-07 ENI(M)/TBI(T)/EII 10P(C) 30

ACC NR: AP6027261

SOURCE CODE: UR/0251/66/042/002/0305/0310

AUTHORS: Mirianashvili, Sh. M. (Corresponding member AN GruzSSR); Nanobashvili, D. I.; Razmadze, Z. G.

ORG: Tbilisi State University (Tbilisskiy gosudarstvennyy universitet)

TITLE: Possible transmutational alloying of indium antimonide

SOURCE: AN GruzSSR. Soobshcheniya, v. 42, no. 2, 1966, 305-310

TOPIC TAGS: semiconductor alloy, neutron bombardment, semiconductor conductivity

ABSTRACT: This paper contains the results obtained from bombarding InSb by slow neutrons. The effectiveness of transmutational alloying should be determinable, but theoretical computations are complicated because few detailed data have appeared thus far in the literature concerning the properties of various impurities in the compounds. Although InSb has been studied in considerable detail, it is not yet clear how some impurities affect conductivity in it. Specimens of n-type InSb with an initial concentration of impurity atoms of  $N_d \approx 3.37 \cdot 10^{13} - 6.17 \cdot 10^{15} \text{ cm}^{-3}$  and p-type InSb with  $N_a \approx 2.93 \cdot 10^{14} - 4.57 \cdot 10^{17} \text{ cm}^{-3}$  were studied. These were exposed in the experimental port of the reactor at the Institute of Physics of the Academy of Sciences, Georgian SSR, at temperatures of 100 and 300 K. For removing distortions of the crystal lattice caused by fast neutrons and by impurities of recoil atoms, the

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L 10355-67

ACC NR: AP6027261

specimens were heated to 375--400C (p-type) and 350C (n-type) after radiation, held at this temperature for 25--30 hours, and then slowly cooled to room temperature. The resulting conductivity of the InSb samples after annealing is determined by the balance between current carriers present before radiation and those formed by transmutational alloying. It was found that, after annealing, the Hall constant assumes values typical of substitutional impurity semiconductors. It was also found that, within the limits of experimental error, the concentrations of current carriers computed from the value of the absorption cross section and measured from the Hall effect are equal. The effect of bombardment tends to decrease the mobility of the current carriers. This effect depends on the initial concentration of free current carriers, on the degree of compensation, and other factors. Annealing restores mobility, but not to the initial value. The reason for this is scattering at chemical impurities introduced from nuclear transmutations. For specimens with concentrations of current carriers less than  $10^{16} \text{ cm}^{-3}$ , the decline in mobility does not exceed 10--15% (for a flux up to  $10^{16} \text{ neutrons/cm}^2$ ). This paper was presented by Sh. M. Mirianashvili, corresponding member of the Academy, on 08 May 1965.

SUB CODE: 20, 11/

SUBM DATE: 08May65/

ORIG REF: 001/

OTH REF: 003

Card 2/2

JB



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Comparison of the spectra of oscillations keyed according to  
phase or amplitude. Radiotekhnika 20 no.9:9-16 S '65.

(MIRA 18:9)

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radiotekhniki i elektrosvyazi imeni A.S. Popova.

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1. Primorskoye geologicheskoye upravleniye.

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RAZMANOVA, Ye.M.; SAVINA, K.V.; SERGEYEVA, A.V.; SOKOLOVA, M.Ye.;  
FOMICHEVA, V.S.; CHERNYSHEVA, V.A.; SHUMILOVA, T.V.

Sensitivity of houseflies to chlorophos prior to its use.  
Zh. mikrobiol. 40 no.7:3-7 J1'63 (MIRA 17:1)

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
PROCESSES AND PROPERTIES INDEX																										548.0																									
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<p>8347. On isomorphism and morphology in a number of crystals. <math>X_2SiH_2C_6H_4CH_3</math>. [X - F, Cl, Br, I]. O. S. ZHDANOV AND Z. P. RAZMANOVA. Dokl. Akad. Nauk, SSSR, 72 (No. 6) 1635-7 (1990) In Russian.</p>																																																			
AS 548 METALLURGICAL LITERATURE CLASSIFICATION																										1134 83477																									
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RAZMANOVA, Z. P.

USSR/Physics - X-ray Analysis

Mar/Apr 51

"X-ray Analysis of Catalysts on the Basis of Aluminum Hydroxide," G. S. Zhdanov, Z. P. Razmanova, Phys Chem Inst Imeni L. Ya. Karpov

"Iz Ak Nauk SSSR, Ser Fiz," Vol XV, No 2, pp 202-208

Subject work is outgrowth of research by authors and V. P. Kotov and G. D. Lyubarskiy (cf. "Problems of Kinetics and Catalysis," 1948). Tests performed allow one to establish effect of aging period on phase and dispersion ability of aluminum hydroxide. Found that sp activity drops at phase transition  $\alpha$ - $\text{Al}_2\text{O}_3$  and that phase changes at temp 800-900°C

LC

187T94

USSR/Physics - X-ray Analysis  
(Contd)

Mar/Apr 51

do not affect sp activity. Authors were assisted by G. K. Borekov. Submitted at the 3d All-Union Conference on Use of X-rays in Study of Materials held 19 - 24 Jun 50 in Leningrad.

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CZECH

Synthesis and roentgenographic study of crystals of organoantimony compounds of types  $m\text{-C}_6\text{H}_4\text{Sb}$  and  $\text{Ar}_3\text{SbX}_2$ .  
V. P. Chishkova, T. V. Takilava, Z. P. Razumova, O. S.

Zhdanov, and K. A. Kocheshkov. *Sbornik State Obshchest Khim.* 2, 992-4 (1933).—The RLi from 19.8 g.  $o\text{-MeC}_6\text{H}_4\text{I}$  and 4.1 g. Li in Et<sub>2</sub>O treated with ice cooling with 6.5 g.  $\text{SbCl}_3$ , stirred 1 hr., strained into ice (to remove residual Li) and extd. with Et<sub>2</sub>O gave 84%  $(o\text{-MeC}_6\text{H}_4)_3\text{Sb}$  (I), m. 102°. Similarly was obtained 71.8%  $m\text{-monomer}$  (II), m. 72°, along with  $(m\text{-MeC}_6\text{H}_4)_3\text{SbCl}_2$ , m. 137° (from the mother liquor).  $p\text{-ClC}_6\text{H}_4\text{MgBr}$  and  $\text{SbCl}_3$  gave 77.5%  $(p\text{-ClC}_6\text{H}_4)_3\text{Sb}$  (III), m. 110.5-11°, which with dry Cl<sub>2</sub> gave the dichloride (IV), m. 189.6°. Similarly  $p\text{-BrC}_6\text{H}_4\text{MgBr}$  gave the dichloride (V), m. 136-0.5°, dichloride (VI), prepd. as usual, m. 185°.  $1\text{-C}_6\text{H}_5\text{MgBr}$  gave 92.6%  $(1\text{-C}_6\text{H}_5)_3\text{Sb}$  (VII), m. 223-3.6°. Treatment of the  $\text{Ar}_3\text{SbCl}_2$  with hot aq. alc. K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> gave 75-90%  $\text{Ar}_3\text{SbF}_6$ . In this way were obtained the following  $m\text{-MeC}_6\text{H}_4$  (VIII), 103.5-9°;  $p\text{-MeC}_6\text{H}_4$  (IX), 118-18.5°;  $p\text{-ClC}_6\text{H}_4$ , m. 115.5-16°;  $p\text{-BrC}_6\text{H}_4$ , 149-9.5°;  $1\text{-C}_6\text{H}_5$ , 279-80°.  $(p\text{-MeC}_6\text{H}_4)_3\text{SbBr}_2$  with  $\text{H}_2\text{S}$  in EtOH satd. with